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ZOOLOGY.

CELL-DIVISION.—The following abstract of recent researches on cell-division is taken from the *Journal of the Royal Microscopical Society.*—Herr T. Boveri believes that the course of karyokinetic division may be generally described in the following terms:—The chromatic nuclear material becomes collected together with a definite number of isolated pieces of a form characteristic of the kind of cell—the chromatic elements; an achromatic filamentar figure is formed in the two poles, either from the substance of the nucleus or from that of the cell. The chromatic elements, so far as their number, form and size allow it, are deposited in the equatorial plane of the achromatic figure; the chromatic elements divide into two halves, one of which makes its way toward either pole; the daughter elements break up in the framework of the new nuclei.

In the ova of *Ascaris lumbricoides* the germinal vesicle has, in the earliest stage, the typical structure of the resting nucleus, and we are justified in supposing that the chromatic elements arise from the framework in exactly the same way as in the other cases, though the details cannot certainly be made out in consequence of the small size of the object. The arrangement of the elements in an equatorial plate, their transverse division, and the formation of daughter-plates, are effected in just the same way as they are now known to be in other cases, and especially in the ova of arthropods. The only point of difference is the relation of the daughter-elements, which remain in the egg after the expulsion of the first polar globule, for these remain isolated, and are so the direct mother-elements of the next spindle.

In the germinal vesicle of the ovum of *Ascaris megalocephala* (Carnoy's type), two independent portions of chromatin are found in the earliest known stage. Though nothing is certainly known of their mode of formation, it may be assumed that they are derived from a typical nuclear framework. This conversion, however, of the reticulum into the chromatic elements, which in other cells and in some ova (*A. lumbricoides*) directly precedes division, appears, in most eggs, to take a long time. The important difference in the eggs of the type of Van Beneden is that there is but one chromatic element; this seems to be unique.

There are many reasons for supposing that the division of the chromatic elements sometimes happens at a time when there is no indication of the achromatic figures of division. The most striking of these cases has been lately described by Flemming. ' Similar phenomena have been observed by the author in the eggs of Ascaris. In the germinal vesicle of *Ascaris lumbricoides* the twenty-four rods exhibit the most distinct transverse division long before the germinal vesicle begins to be converted into the spindle.

After considering several cases in different forms the author expresses his belief that they form parts of a series in the degeneration of the process of nuclear and cellular division. In the case of *Corydalis cava,* described by Strasburger, the process is least rudimentary; two typical daughter-nuclei arise, but these again fuse into a single nucleus; in Thysanozoon and *A. megalocephala* daughter-stars or plates are formed, but at once pass into a resting nucleus. In the cells of Flemming and Carnoy there is a division of the chromatic elements, but no arrangement in two groups.

Herr Boveri suggests that in the parthenogenetic eggs described by Weismann as having only one polar globule, we have to do with the same process as in the eggs of Ascarids; there are two divisions, but the second is limited to division of the chromatic elements. If this be so, the parthenogenetic development is not to be regarded as dependent on the suppression of the development of the second polar globule, but by its retention in the egg and the fusion of its nucleus with the ovarian nucleus. The second polar globule may thus be regarded as playing the part of the spermatozoon, and it may be said that parthenogenesis is due to fertilization by the second polar globule.

In the achromatic nuclear figure the mode of origin of the spindle, and the complete want of polar rays are of significance. The often discussed question whether the nuclear spindle is derived from the substance of the nucleus, or of the cell, may, in the case of Carnoy's type of *Ascaris megalocephala,* be certainly decided in favor of the former.

NERVOUS SYSTEM OF THE STARFISH.—Dr. Carl F. Jickeli recognizes (*Zool. Anzeiger*, 1888, p. 339) four elements in the nervous system of the starfishes:—(1) The ambulacral nervous system; (2) the sub-epithelial plexus of the surface of the body, described by Romanes and Ewart; (3) the paired thickenings of the walls of the perihæmal system described by Lange; and (4) a visceral system. The sub-epithelial plexus is connected with the ambulacral system. Lange's nerves consist of three layers; (*a*) a delicate flattened epithelium lining the perihæmal space; (*b*) large ganglion cells, the processes of which form nerve fibres; and (*c*) a connective-tissue layer which forms a partition between Lange's and the ambulacral nerves. Jickeli's visceral system consists of a layer of fine fibres containing stellate cells at the base of the epithelium of the digestive tract. This system is best developed in the anal region of *Astropecten andromeda.*

STIZOSTEDIUM IN THE BASIN OF THE CONNECTICUT.—I had the pleasure of announcing in the AMERICAN NATURALIST for October, 1887, the discovery of a specimen of *Stizostedium vitreum* at Cromwell, Conn., in a tributary of the Connecticut River. This is, so far as I am aware, the only recorded instance of the occurrence of the species in any of the rivers of the Atlantic coast between the St. Lawrence and the Susquehanna. It may be worth while to mention that in August, 1888, another specimen of the same species was taken very near the same locality. The second specimen, like the first, is a small one, each of them measuring about twelve inches in length. Both specimens are preserved in the Museum of Wesleyan University.—*William North Rice, Wesleyan University, Middletown, Conn.*

DESCRIPTION OF A NEW SPECIES OF MEADOW MOUSE FROM THE BLACK HILLS OF DAKOTA.—In the higher parts of the Black Hills there lives a species of Arvicola resembling our eastern Meadow Mouse (*A. riparius*) in size and coloration, but differing from it strikingly in the possession of a very long tail and very large ears. Two specimens were collected in some brush land bordering a creek in the vicinity of Custer, Dakota, by Mr. Vernon Bailey, in July last. Examination of their teeth shows them to belong to the subgenus Myonomes. The species has no nearer relative than *Arvicola townsendi*, from which it differs in relative proportions and in other particulars. It may be known by the following diagnosis:

ARVICOLA (MYONOMES) LONGICAUDUS sp. nov.

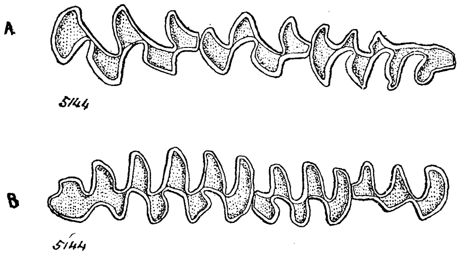
Long-tailed Arvicola.

Type No. $\frac{4509}{5144}$, fem. ad., Merriam Collection. From Custer (in the Black Hills), Dakota, July 19, 1887. Vernon Bailey.

Description of type.—Size about that of *A. riparius.* Ears very large, suborbicular, with a large antitragus capable of completely closing the meatus; tail very long, relatively longer than that of any heretofore described species of the genus; color much as in *A. riparius;* sides and upper parts bister, more or less grizzled, with a faint tinge of rusty along the middle of the back; under parts whitish, the plumbeus basal portion of the fur showing through. There is no sharp line of demarcation between the color of the belly and that of the sides; the tail is slightly paler below than above, but lacks a distinct line of demarcation.

Measurements (taken in the flesh): total length, 185 mm.; tail, 65 mm.; hind foot, 21 mm. Ear (measured from the dry skin):

height from anterior base, 14 mm.; from crown, 8 mm.; breadth, 13 mm. Another specimen, also a female, taken at the same locality, July 13, 1888, agrees with the foregoing in size and coloration. It measured in the flesh: length, 184 mm.; tail, 61 mm.: hind foot, 22 mm.



Molar teeth of *Arvicola longicaudus* ♀
A. Left Upper series B. Left lower series.

Dental characters.—A glance at the accompanying drawing of the crowns of the molar teeth shows that *Arvicola longicaudus* has the back upper molar of Myonomes. The middle upper molar, however, lacks any trace of the postero-internal loop or spur supposed to be characteristic of this subgenus, and the lower teeth present several peculiarities not mentioned in any description or drawing heretofore published.—*Dr. C. Hart Merriam.*

ZOOLOGICAL NEWS.—GENERAL.—The zoological papers in the *Journal of the Elisha Mitchell Scientific Society* for 1888 are: "A List of Fishes in the Museum of the University of North Carolina," by V. S. Bryant; "List of the Butterflies collected at Chapel Hill, N. C.," by A. Braswell; "Aquatic Respiration in the Muskrat," by W. L. Spoon; "New Instances of Protective Resemblance in Spiders," and "Notes on the Tube-inhabiting Spider, *Lycosa fatifera,*" by G. F. Atkinson.

PROTOZOA.—The genus Gromia is usually regarded as an inhabitant of moist earth, but Dr. H. Blanc describes a species which he considers as a member of the genus from the ooze at the bottom of Lake Geneva. His paper, which occurs in the *Recueil Zool. Suisse* (Vol. IV.), is illustrated by a plate.

WORMS.—Dr. Edward Tuckerman records (*Zool. Anzeiger,* No. 287) a second specimen of *Tænia saginata,* which was larger than the former specimen (AM. NAT., p. 360, 1888), measuring 8.253 metres. This latter specimen presents several interesting anomalies of structure. In the same number Dr. Edouard Brandt records two instances of *Tænia cucumerina* in the human body.

Dr. A. C. Stokes describes two new North American Oligochæte worms (*The Microscope*, viii., 1888), *Ælosoma distichum* and *Pristina flavifrons*, and Gustav Eisen characterizes a new genus of the same group (*Mem. Cal. Acad.*, ii., 1888) under the name *Sutroa rostrata.*

Criodrilus lacuum is made the subject of an extensive anatomical monograph by A. Collier in the *Zeitsch Wiss. Zoologie*, Bd. xlvi., 1888.

MOLLUSCS.—The crystalline style is a peculiar structure found in a pocket developed from the stomach of certain lamellibranch molluscs. Many theories have been advanced as to its nature and physiological functions. Möbius maintained that it was a reserve food supply, and recently (*Biol. Centralblatt*, 1888) Haseloff has experimented on *Mytilus edulis*, in which the structure is almost constantly present. He starved some individuals for a few days, and found that the style had disappeared. Others of the same starved lot were afterward fed with abundant food, and on examination were found to possess the style. Haseloff regards the style as a chemical modification of surplus food rather than a secretion.

MALACOPODA—Peripatus comes in for several papers recently. Adam Sedgwick concludes his account of the development of the Cape species of the genus in the *Quarterly Journal of Microscopical Science*, Vol. XXVIII., part 3, and in part 4 of the same volume monographs the thirteen or fourteen known species of the genus. W. L. Sclater describes the early development of a South American species of the genus in part 3, and Miss Lilian Sheldon describes points in the anatomy of *P. capensis* and *P. novæ-zelandiæ* in part 4 of the same volume. In Vol. XII. of the *Zoologist*, S. A. Olliff has notes on Periaptus in New South Wales, and F. Jeffrey Bell calls attention to the fact that years ago Schmarda described a species of the genus (*P. quitensis*) from South America.

CRUSTACEA.—Bouvier treats of the circulatory apparatus of the Decapod crabs in the *Bulletin de la Societé Philomathique de Paris*, Vol. XII. His observations were made on the genera Maia, Stenorhynclus, Pagurus, Astacus, Palinurus, Portunus, etc.

Hoek describes a new parasitic Cirripede (*Sylon challengeri*) in Spencer Bates' report on the Macrura of the Challenger.

CEPHALOCHORDA.—Dr. E. Rhode (*Zool. Anzeiger*, XI.) describes the histology of the nervous system of Amphioxus. He finds it to resemble closely that of the Chætopod Sthenelais, in the presence of colossal nerve fibres given off from regularly arranged giant ganglion cells. In both the supporting tissue is of ectodermal origin.

FISHES.—Messrs. Jenkins and Everman discovered a new species of the genus Chologaster this summer in the outlet to Lake Drummond, in the dismal swamp of Virginia. The discovery is especially interesting, as the genus is presumably the representative of the ancestors of the blind-fishes, Amblyopsis and Typhlichthys. Only their species of the genus — *C. cornutus, C. papilliferus* and *C. agassizii* were known before, and these were represented by but few specimens. Jenkins and Evermann were fortunate in obtaining a considerable amount of material of the new species.

MAMMALS.—Dr. Frederick Tuckerman describes the histological structure of the taste-organs of the bat, *Vespertilio subulatus*, in Vol. II. of the *Journal of Morphology*.

Some years ago the greenish color of certain of the sloths was attributed to the presence of an algæ upon the hair. Recently Madam Weber von Bosse has described two genera and three species of these parasitic algæ. The new genus Trichophilus is green, the other, Cyanoderma, with its two species is violet. From 150,000 to 200,000 individuals of these algæ may occur on a single hair.

ENTOMOLOGY.[1]

SCUDDER'S BUTTERFLIES OF NEW ENGLAND.[2]—The long-looked-for work by Mr. Scudder, on the butterflies of New England, is about to appear. We are in receipt of a prospectus which includes sample pages and plates. Judging from this the work will surpass in fulness of detail and magnificence of illustration anything of the kind yet published; and the scope of the work is an unusually broad one, including accounts of the structure of these insects in all stages of life, their variation, habits, manners, life-history, and their enemies; also frequent discussions of problems suggested by their study.

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[1] This department is edited by Professor J. H. Comstock, Cornell University, Ithaca, N. Y., to whom communications, books for notice, etc., should be sent.

[2] The butterflies of the Eastern United States and Canada with special reference to New England, by Samuel Hubbard Scudder, Cambridge; published by the author, 1888. Twelve monthly parts, $5.00 per part, or $50.00 for the whole work if paid for before Jan. 1, 1889.